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THE SUPPLY AND STATUS OF NAVAL-STORES TIMBER IN SURVEY UNIT NO. 2, GEORGIA

By

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* - This is an advance release of Forest Survey data that will be included in complete reports to be published later. This information is subject to correction or amplification as computations proceed.

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THE SUPPLY AND STATUS OF NAVAL-STORES TIMBER

IN SURVEY UNIT NO. 2, GEORGIA

This release is a brief presentation of the more significant naval-stores data gathered by the Forest Survey in Unit No. 2, Georgia. The Survey is an activity of the Southern Forest Experiment Station with headquarters at New Orleans, Louisiana. Its objects are to make an inventory of the South's present supply of timber and other forest products; and to formulate forest-management policies based on estimates of timber growth and drain, interpreted in the light of anticipated future economic and social conditions. This and other releases of advance survey information are preliminary to the publication of final, complete reports for each survey unit. In these final reports, all phases of the inventory data will be shown, correlated with existing ecomomic conditions.

The land-use classification and 1934-35 turpentine-crop data, and all information concerning the number, size, and species of trees in this Unit, were computed from basic information gathered on 6,911 one-quarter acre sample plots uniformly distributed throughout the entire area at intervals of 660 feet on parallel east-west compass lines 10 miles apart. The resource inventory was made during the period from April to July 1934. Working independently of the line-plot survey, other field men gathered data, by means of a still-to-still canvass, on the number, size, and character of naval-stores operations. In this canvass, made during the period from July to September 1934, the field men questioned practically 100 percent of the turpentine still operators in the Unit.

Land-use Classes

Survey Unit No. 2, located in the southwestern part of Georgia, is shown in figure 1. It is a part of the Eastern Coastal Plain; its average elevation above sea level ranges from 100 to 400 feet. The Unit is rolling, and is well drained by such river systems as the Flint, Chattahoochee, and Ocmulgee, all of which, with their numerous tributaries, flow in a southerly direction. Its light, sandy soils are well adapted to the cultivation of a variety of crops. Comprising a land area of approximately 5,585,900 acres, the Unit is predominantly rural. The widespread network of railroads, highways, and roads that interconnect its numerous small towns affords excellent transportation facilities.

More than half the total land area, or 3,020,400 acres, is forest land. Approximately 97 percent of this area falls into three major topographic classes, namely: (1) rolling uplands, 59 percent; (2) swamps and bays, 22 percent; (3) flatwoods, 16 percent; the remaining 3 percent is in river bottomlands.

Table 1 classifies the area by land uses. Cultivated land, exclusive of temporarily idle and abandoned agricultural land, occupies approximately 37 percent of the total land area; thus accounting in part for the importance of farm crop production in the Unit. Forest products, among which naval-stores rank high, are also important. The Unit lies wholly within the naval-stores belt, where extensive turpentine operations are being carried on.

TABLE 1. -- *Area classified by major land uses*

Land-use classes	Area in acres		Percent of total area	
Forest		3,020,400		54.1
Agricultural:				
In cultivation:				
Old cropland [1]	2,048,200		36.7	
New cropland [2]	8,800		0.2	
Out of cultivation:				
Idle [3]	207,700		3.7	
Abandoned [4]	95,900		1.7	
Improved pasture [5]	63,100		1.1	
Total agricultural		2,423,700		43.4
Other:				
Waterways	26,400		0.5	
Towns and villages	50,300		0.9	
Roads, railroads, etc.	65,100		1.1	
Total other		141,800		2.5
Total area		5,585,900		100.0

[1] Land cultivated at least five years and on which a farm crop was raised within two years prior to the date of survey.

[2] Land recently converted from forest cropland.

[3] Cultivated land that has been idle for two years or more, but has not reached the abandoned stage.

[4] Land once cultivated but showing distinct evidence of having been abandoned for agricultural crop production; no attempt has been made to maintain it as improved pasture.

[5] Cleared land under fence used primarily for grazing; a real attempt has been made to produce and maintain a sod.

Forest Types and Turpentine History

The 3,014,000 acres[1] that bear commercial species are shown in table 2, classified by the major forest types and by turpentine crop history. The turpentine crop histories are defined as follows:

Round crop areas: Areas bearing sufficient longleaf and slash pine trees to justify future working, upon which no cups have as yet been hung.

[1] In the following tables, the 3,014,000 acres of forest area used as a basis in calculations does not include approximately 6,400 acres of noncommodity forest land noted in the field work. Noncommodity forest land is defined as forest areas that have not the qualities essential for the growth of commercial timber species; since these areas do not bear commercial timber species, they are not included in the three major type groups.

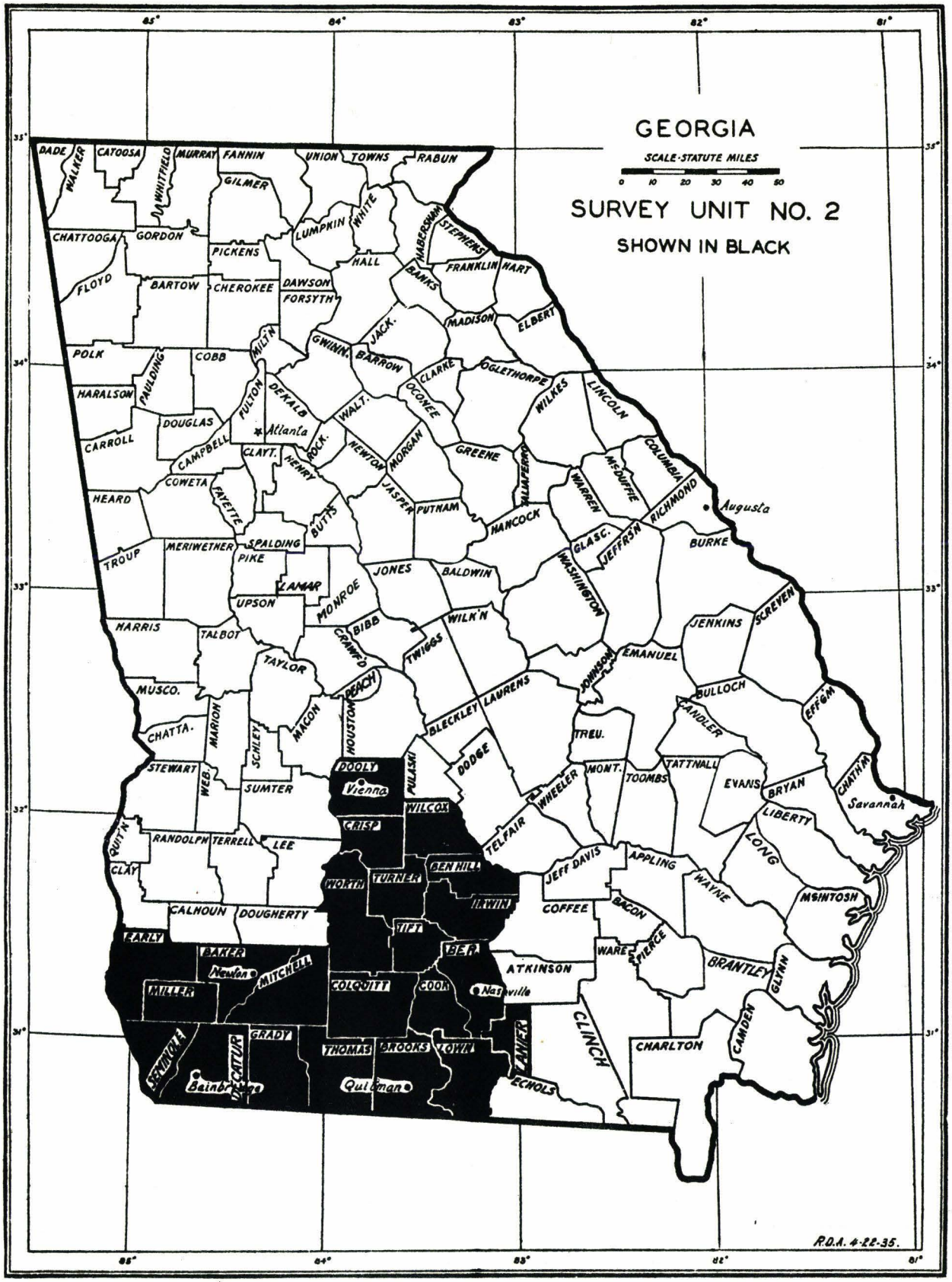

FIGURE 1. -- Geographic location of Survey Unit No. 2, Georgia.

Working crop areas: Areas bearing trees that are now being worked for naval stores.

Idle crop areas: Areas bearing trees once worked for naval stores, on which operations were discontinued before the turpentine faces reached a height of five feet. These faces may possibly be worked again.

Worked-out crop areas: Areas bearing trees once worked for naval stores, on which operations were discontinued when the turpentine faces had reached a height of five feet or more. Worked-out crop areas include both crops in which the trees are resting prior to further working on back faces, and crops in which the trees are completely exhausted for naval-stores operations.

Nonturpentine areas: Areas occupied for the most part by nonturpentine species, in which there are too few turpentine trees to justify working.

The turpentine acreage makes up more than 78 percent of the forest area. Working crops occupy at present 854,000 acres, or 28.3 percent of the total forest area. Since nearly 22 percent of the forest area is in round crops, a considerable supply of trees suitable for future naval-stores working is indicated.

TABLE 2. -- *Forest area that bears commercial timber species, classified by turpentine crop history and by forest type groups, season 1934-35*

Turpentine crop history	Forest type groups classified by predominant species			Total	Percent of total
	Longleaf and slash pine	Loblolly and other nonturpentine pine	Hardwood		
	Acres				
Round	565,600	55,900	32,000	653,500	21.7
Working	777,300	49,500	27,200	854,000	28.3
Idle	51,100	1,600	-	52,700	1.7
Worked-out and resting	708,600	47,100	41,500	797,200	26.5
Nonturpentine area	13,600	294,800	348,200	656,600	21.8
Total	2,116,200	448,900	448,900	3,014,000	100.0
Percent of total	70.2	14.9	14.9	100.0	

Classification of Working Turpentine Area

The total working turpentine area in this Unit, 854,000 acres, is being worked by seven classes of naval-stores operators. They are defined as follows:

Operator: A person who maintains a turpentine still and processes crude gum from his own or leased timber exclusively.

Operator and farmer: An operator who spends at least half his time farming.

Operator and gum-buyer: A person who, in addition to stilling gum from his own or leased timber, buys crude gum from other producers, processes it, and sells the finished products, turpentine and rosin, in his own name.

Operator and custom-stiller: A person who, in addition to stilling gum from his own or leased timber, processes gum for other producers, who market the turpentine and rosin in their own names.

Operator, gum-buyer, and custom-stiller: An operator who is also a gum-buyer and a custom-stiller.

Gum-producer-seller: A person who maintains no still, but works his own or leased timber for crude gum, which he sells to stillers.

Gum-producer-shipper: A person who maintains no still, but works his own or leased timber for crude gum which, when custom-stilled, he markets in his own name.

Table 3 shows the owned and leased area that each class of gum-producer works. Nearly seven-eights of the working naval-stores area in the Unit is leased. Practically 95 percent of the working naval-stores acreage is in the hands of the several classes of still operators; which means that only 5 percent of the working area is being worked by small gum-producers.

TABLE 3. -- *Turpentine working acreage classified as owned and leased, and by types of operations producing crude gum, season 1934-35*

Types of operations	Gross working acreage			Percent of total
	Owned	Leased	Total	
	Acres			
Operator	51,500	499,500	551,000	64.5
Operator and farmer	9,900	16,300	26,200	3.1
Operator and gum-buyer	23,700	180,800	204,500	23.9
Operator and custom-stiller	2,200	25,100	27,300	3.2
Operator, gum-buyer, and custom-stiller	-	1,400	1,400	.2
Gum-producer-seller	23,100 [1]	15,300 [1]	38,400 [1]	4.5
Gum-producer -shipper	3,200 [1]	2,000 [1]	5,200 [1]	.6
Total	113,600	740,400	854,000	100.0
Percent of total	13.3	86.7	100.0	

[1] Estimated from information furnished by still operators.

Table 2 shows the forest area classified by the turpentine crop histories as indicated by the proportion of sample plots found in each class of crop; table 4, on the other hand, classifies the turpentine condition of longleaf and slash pine trees regardless of the history of the crops in which they are found. The trees are shown in two-inch diameter classes--all forest types combined. Definitions are as follows:

Round trees: Longleaf and slash pine trees that have never been worked for naval stores.

Working trees: Longleaf and slash pine trees that are being worked for naval stores.

Idle trees: Trees that have been worked for naval stores in the past, but are not now, for one reason or another, being worked, although their naval-stores productivity has not been exhausted; such trees have one or more future faces.

Worked-out trees: Trees that have been worked until their usefulness as naval-stores producers has been exhausted.

Nearly 67 percent, or a total of 80,463,000, of the slash and longleaf pine trees in the Unit are round and between 3.0 and 8.9 inches in diameter. These trees form the nucleus from which future naval-stores production must develop; hence extensive cuttings of these immature trees, such as for pulpwood, will reduce the growing stock upon which the naval-stores industry must depend.

TABLE 4. -- *Number of longleaf and slash pine trees, classified by diameter classes and their individual turpentine history, season 1934-35*

Tree diameter 4½ feet from the ground [1]	Tree turpentine history				Total	Percent of total
	Round	Working	Idle	Worked-out		
Inches	*Thousands of trees* [2]					
3.0 - 4.9	36,587	- [3]	- [3]	- [3]	36,587	30.4
5.0 - 6.9	27,196	- [3]	332	243	27,771	23.1
7.0 - 8.9	16,680	2,141	2,192	956	21,969	18.2
9.0 - 10.9	5,911	5,592	2,812	1,799	16,114	13.4
11.0 - 12.9	2,345	3,371	2,013	1,748	9,477	7.9
13.0 - 14.9	943	1,678	1,007	1,368	4,996	4.1
15.0 - 16.9	403	591	431	693	2,118	1.8
17.0 - 18.9	188	188	176	249	801	.7
19.0 and larger	150	134	80	153	517	.4
Total	90,403	13,695	9,043	7,209	120,350	100.0
Percent of total	75.1	11.4	7.5	6.0	100.0	

[1] For working, idle, and worked-out turpentine trees this diameter is calculated from the diameter measured 10 feet from the ground in order to correct for the influence of turpentine faces at breast height.

[2] To convert to full number of cups add "000".

[3] The number of trees in this class is negligible.

TABLE 5. -- *Working turpentine cups classified by year of working and diameter of working trees, season 1934-35*

Tree diameter $4\frac{1}{2}$ feet from the ground [1]	Year of working												Total	
	1st year		2nd year		3rd year		4th year		5th year		6th year and up			
Inches	Thousands [2] of cups	Percent	Thousands [2] of cups	Percent	Thousands [2] of cups	Percent	Thousands [2] of cups	Percent	Thousands [2] of cups	Percent	Thousands [2] of cups	Percent	Thousands [2] of cups	Percent
Under 7.0 [3]	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7.0 - 8.9	447	10.9	287	8.4	112	11.4	396	21.3	578	23.9	323	18.0	2,143	14.7
9.0 - 10.9	1,713	41.7	1,630	47.7	470	47.8	550	29.6	684	28.2	559	31.2	5,606	38.5
11.0 - 12.9	1,055	25.7	719	21.0	224	22.8	511	27.5	642	26.5	499	27.8	3,650	25.0
13.0 - 14.9	594	14.5	415	12.1	99	10.0	220	11.9	358	14.8	265	14.8	1,951	13.4
15.0 - 16.9	169	4.1	182	5.3	48	4.9	102	5.5	125	5.2	102	5.7	728	5.0
17.0 - 18.9	61	1.5	93	2.7	25	2.5	48	2.6	22	.9	35	1.9	284	1.9
19.0 and larger	64	1.6	96	2.8	6	.6	29	1.6	13	.5	10	.6	218	1.5
Total	4,103	100.0	3,422	100.0	984	100.0	1,856	100.0	2,422	100.0	1,793	100.0	14,580	100.0
Percent	28.1		23.5		6.8		12.7		16.6		12.3		100.0	

[1] Corrected to remove the influence of turpentining on tree diameter; calculated from the diameter measured 10 feet from the ground.

[2] To convert to full number of cups add "000".

[3] The number of cups on trees under 7.0 inches in diameter is negligible.

As shown in table 4, the total number of trees now being worked in the Unit is 13,695,000. The number of cups hanging on them is 14,580,000, an average of 1.06 cups per tree. Table 5 classifies these working cups by the diameter of the trees on which they hang and by the stage of working of the faces. During the past three years there has been a pronounced tendency in this Unit to cup the larger trees, ranging between 9.0 and 12.9 inches, rather than those less than 9.0 inches in diameter. In addition, the noticeably smaller number of third year cups in proportion to that of any other year (only 6.8 percent of the total) indicates that during the naval-stores year 1932-33 an abnormally small number of virgin cups were hung. During the past two years, however, there has been a noticeably large increase in the number of virgin cups hung.

Naval-stores operators commonly lease a large part of the timber they work for turpentine; but the extent to which they follow this practice differs in different regions of the naval-stores belt. Table 6 shows that in this Unit during the season 1934-35, more than 86 percent of the cups were on leased timber. Of the total number of working cups, 694,000, or 4.8 percent of the total, were handled by the gum-producer-seller and gum-producer-shipper classes. This fact indicates that many a small farmer (more than 300) in the Unit turned his hand toward gum producing as a means of increasing his cash income.

TABLE 6. -- *Number of turpentine operations and working turpentine cups on land classified as owned and leased, by types of operations, season 1934-35.*

Types of operations	Number of operations [1]	Working cups			
		On owned land	On leased land	Total	Percent of total
		Thousands of cups [2]			
Operator	86	986	8,469	9,455	64.8
Operator and farmer	7	144	277	421	2.9
Operator and gum-buyer	25	408	3,090	3,498	24.0
Operator and custom-stiller	6	36	455	491	3.4
Operator, gum-buyer, and custom-stiller	2	-	21	21	.1
Gum-producer-seller	325 [3]	368 [3]	243 [3]	611 [3]	4.2
Gum-producer-shipper	10 [3]	50 [3]	33 [3]	83 [3]	.6
Total	461	1,992	12,588	14,580	100.0
Percent of total		13.7	86.3	100.0	

[1] With the exception of the last two types of operations, these figures represent the number actually visited during July to September 1934 in the still-to-still canvass. Tabular figures for the gum-producer-sellers and gum-producer-shippers indicate the approximate number of operations working during the naval-stores year 1933-34. Corresponding figures for 1934-35 were approximately the same.

[2] To convert to full number of cups add "000".

[3] Estimated from information furnished by still operators.

Table 7 classifies the 4,103,000 first-year cups, shown in table 5, accord-

ing to whether they were hung on front-cupped or back-cupped trees. A large number (nearly 62 percent) of these virgin cups were hung on back-cupped trees; that is, trees on which one or more turpentine faces had been made and worked out in a previous operation. Only 11 percent of the virgin cups were hung on trees less than 9.0 inches in diameter.

TABLE 7. -- *First-year turpentine cups on front-cupped and back-cupped trees, season 1934-35*

Tree diameter 4½ feet from the ground [1]	On front-cupped trees		On back-cupped trees		Total	
Inches	*Thousands of cups* [2]	*Percent*	*Thousands of cups* [2]	*Percent*	*Thousands of cups* [2]	*Percent*
Under 7.0 [3]	-	-	-	-	-	-
7.0 - 8.9	244	15.5	203	8.0	447	10.9
9.0 - 10.9	715	45.5	998	39.4	1,713	
11.0 - 12.9	352	22.4	703	27.8	1,055	25.7
13.0 - 14.9	175	11.1	419	16.5	594	14.5
15.0 - 16.9	53	3.4	116	4.6	169	4.1
17.0 - 18.9	9	.6	52	2.1	61	1.5
19.0 and larger	23	1.5	41	1.6	64	1.6
Total	1,571	100.0	2,532	100.0	4,103	100.0
Percent of total	38.3		61.7		100.0	

[1] Corrected to remove the influence of turpentining on tree diameter; calculated from diameters measured at 10 feet from the ground.

[2] To convert to full number of cups add "000".

[3] The number of cups on trees under 7.0 inches in diameter is negligible.

Gum Naval-stores Production 1933-34

The line-plot survey obtained no data on the number of naval-stores operations or their production. The number of naval-stores operators at work during the season 1934-35 was taken in an independent supplementary canvass of stills. The estimate of croppage for that season, shown in table 5, was based primarily on the line-plot survey data, adjusted somewhat as a result of the data obtained in the supplementary canvass. Naval-stores production for the season 1934-35 could not be obtained at the midseason date of the supplementary canvass, but the production for the season 1933-34 was taken. It is summarized in table 8.

It was often possible to confirm the production data by sales records and factors accounts, but it was not possible to check the 1933-34 croppage figures that the operators furnished. Accordingly, the data on average production per crop in naval-stores units for 1933-34 cannot be verified by the Survey. They are presented here for what they may be worth. These yields will appear unusually high to many persons, but they may possibly be explained by the presence of exceptionally thrifty timber stands in this Unit, by the availability of cheap labor, and by favorable weather conditions, which made possible the chipping of an abnormally large number of streaks during the 1933-34 season.

TABLE 8. -- *Naval-stores croppage and production, classified by types of operations, season 1933-34*

Types of operations	Number of operations [1]	Thousands of working cups [2]	Production in naval-stores units [3]	Average production per crop in naval-stores units [3]
Operator	86	8,645	41,790	48.3
Operator and farmer	7	403	1,900	47.1
Operator and gum-buyer	25	3,168	15,470	48.8
Operator and custom-stiller)				
Operator, gum-buyer, and) custom-stiller)	8	485	2,380	49.1
Gum-producer-selelr	325 [4]	558 [4]	2,070 [4]	37.0
Gum-producer-shipper	10 [4]	75 [4]	270 [4]	36.0
Total	461	13,334	63,880	47.9

[1] Tabular figures for the last two types of operations apply to the naval-stores years 1933-34. The number of operations in the other types applies strictly to the naval-stores year 1934-35, but is approximately correct for 1933-34.

[2] To convert to full number of cups add "000".

[3] A naval-stores unit is made up of one 50-gallon barrel of turpentine and three and one-third 500-pound (gross) barrels of rosin.

[4] Estimated from information furnished by still operators.

Summary

Georgia Survey Unit No. 2 covers an area of nearly 5,586,000 acres, of which 3,020,400 acres, or approximately 54 percent, is forest land. More than two million acres, or approximately 78 percent of the forest area, bears a sufficient quantity of turpentine timber to classify it as naval-stores land. The total number of turpentine trees is more than 120 million; 80 million, or approximately two-thirds of these are round and between 3.0 and 8.9 inches in diameter. The total number of working trees during 1934-35 was 13,695,000; total working cups, 14,580,000; total virgin cups, 4,103,000, an increase of more than a half million over the previous year, and more than three million over 1932-33. One hundred and twenty-six stills are located in the Unit, the bulk of whose crude gum (86.3 percent of the working cups in 1934-35) comes from leased land. The average production per crop in 1933-34 was approximately 48 barrels.